sPHENIX EMCal Status update: 1/19/2016

Prototype/ Beamtest

- 18 1-D blocks (each block is 2 towers) have been received from UIUC,
  - 4 blocks have been assembled/epoxied together to form first 1x8 row of prototype towers
  - Second group of 4 have been prepared for epoxying

- Received final sample block from THP (#7).
  - THP will produce 16 blocks.
  - THP had enough fiber to produce 3 more blocks. We sent additional fiber for 4 blocks.
  - UIUC can produce more blocks if THP cannot.
  - With 18 UIUC and 16 THP blocks, we should have enough to assemble an 8x8 tower prototype.

- First 1x8 channel preamp boards are being tested, instrumented with 2 towers of sipms
  - Prototype interface/controller board is being tested

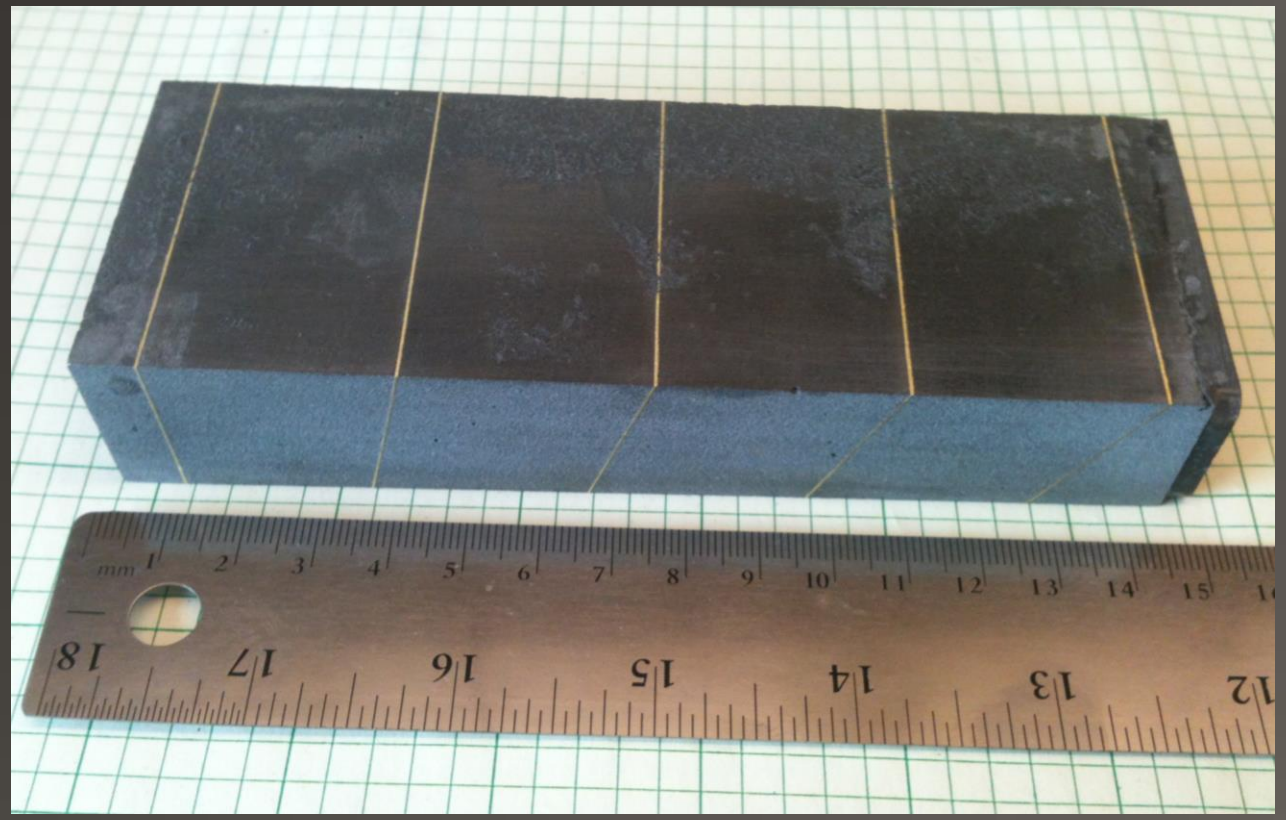
PHENIX Run 16 IR test

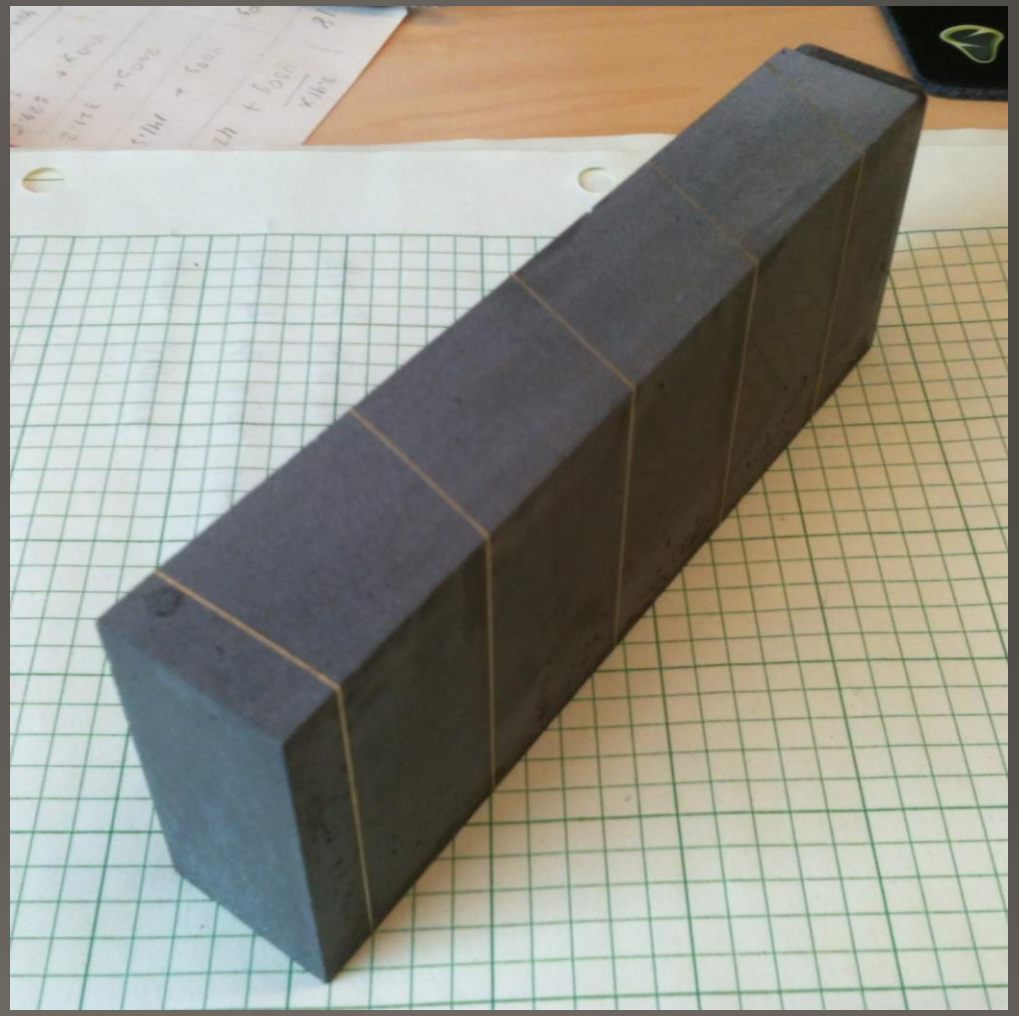
- One 1x8 preamp board and interface/controller board, partially populated with sipms to test controller functionality, gain monitoring and control, temperature compensation, sipm radiation damage.

EMCal Detector Design

- Met with Chris Cullen to discuss mechanical design (support, cooling requirements, installation procedures)

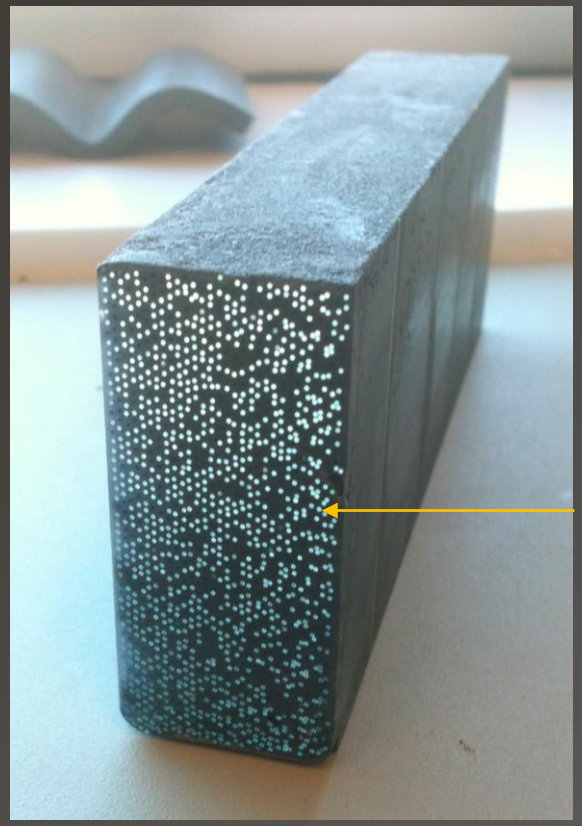
Test block #7 from THP (rec'd 1/8/2016)



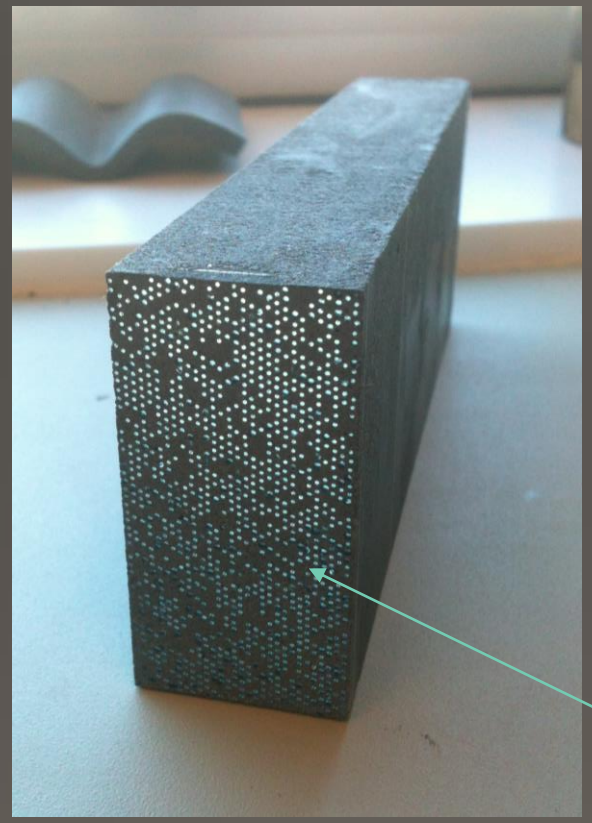


Test block #7 from THP (rec'd 1/8/2016)

Thin end



Fiber Positioning Could be More uniform



Thick end

Ends machined so that most fibers are exposed – not machined to finished dimensions.

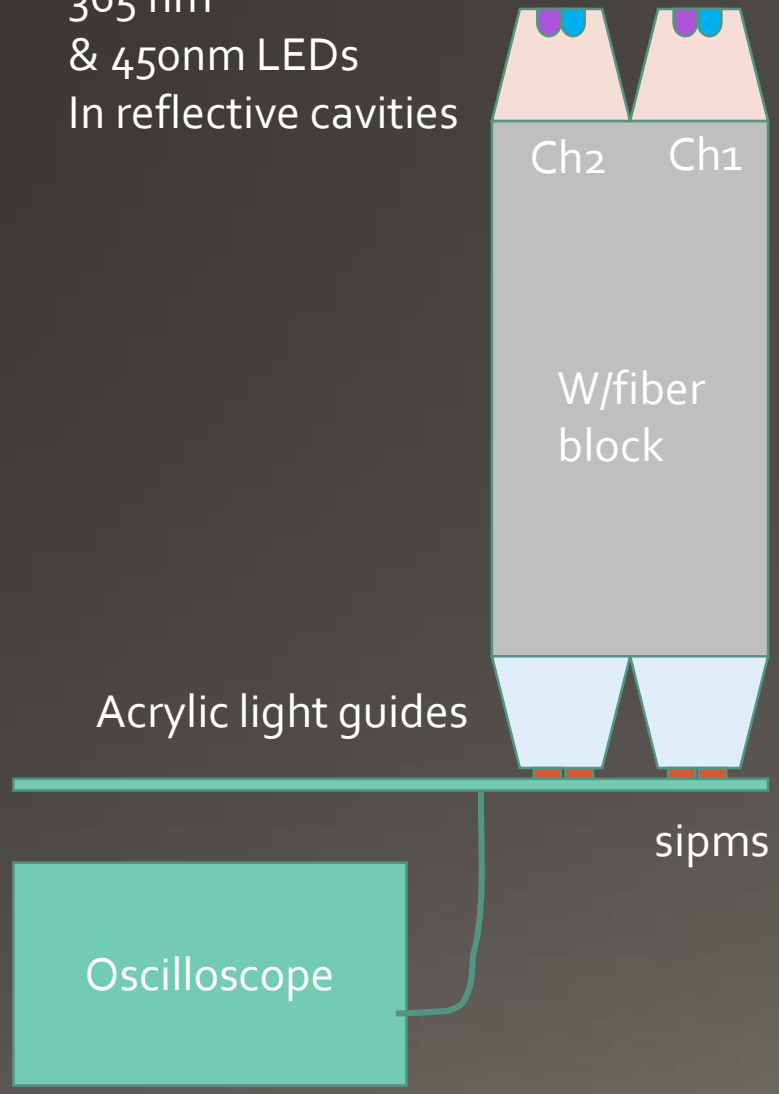
Even after machining down to 1mm from last mesh at thick end of block (reflector end), ~3% of fiber ends were still covered.
* Fibers slipped out of mesh during assembly?

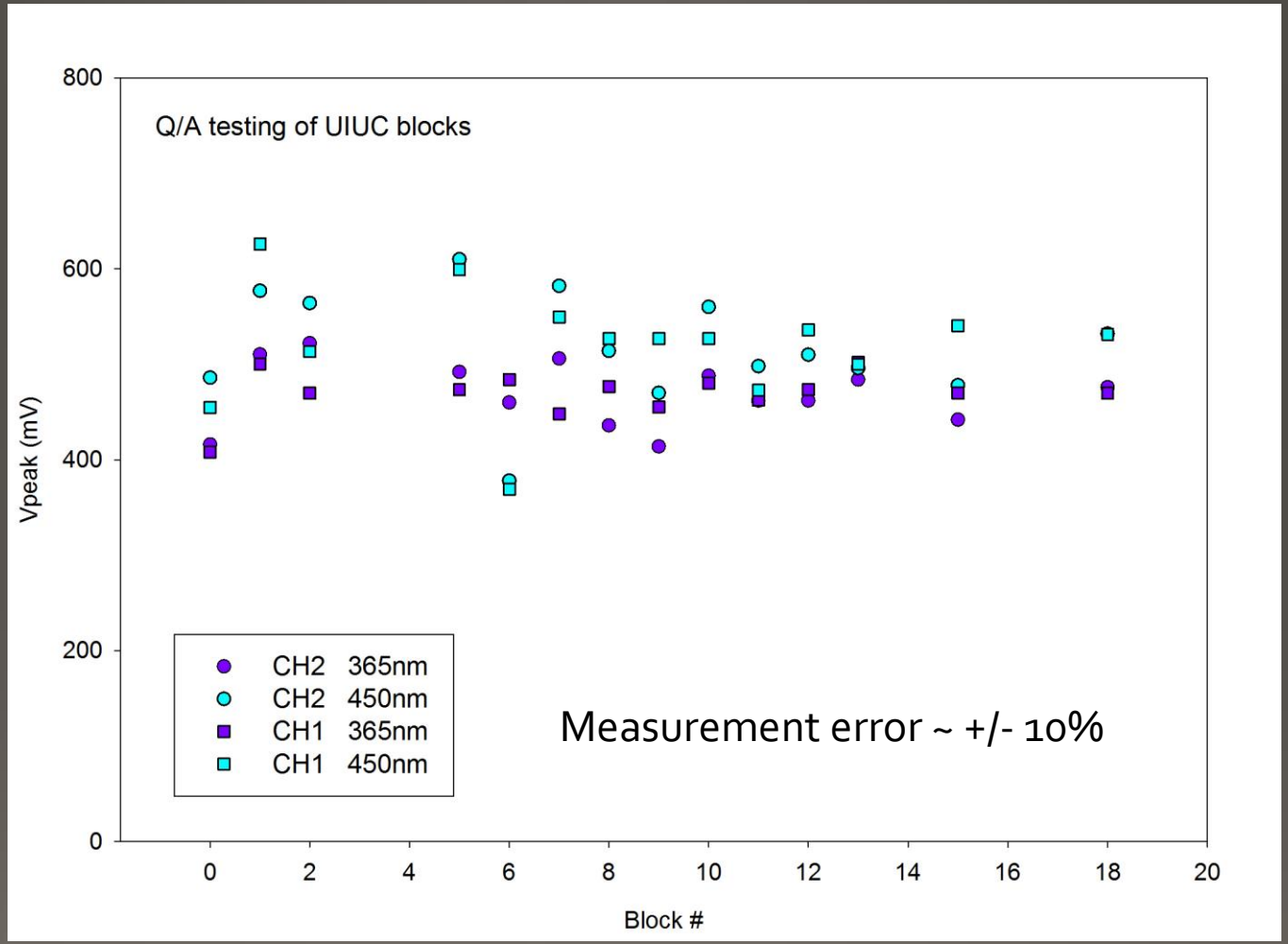
- Made with new meshes - 1560 fibers/block
- Fibers not damaged on surfaces
- Fiber positioning at thin end not as uniform as at thick end
- Density ~ 10.1 g/cm^3

Stack of 18 UIUC blocks (+ 2 THP)

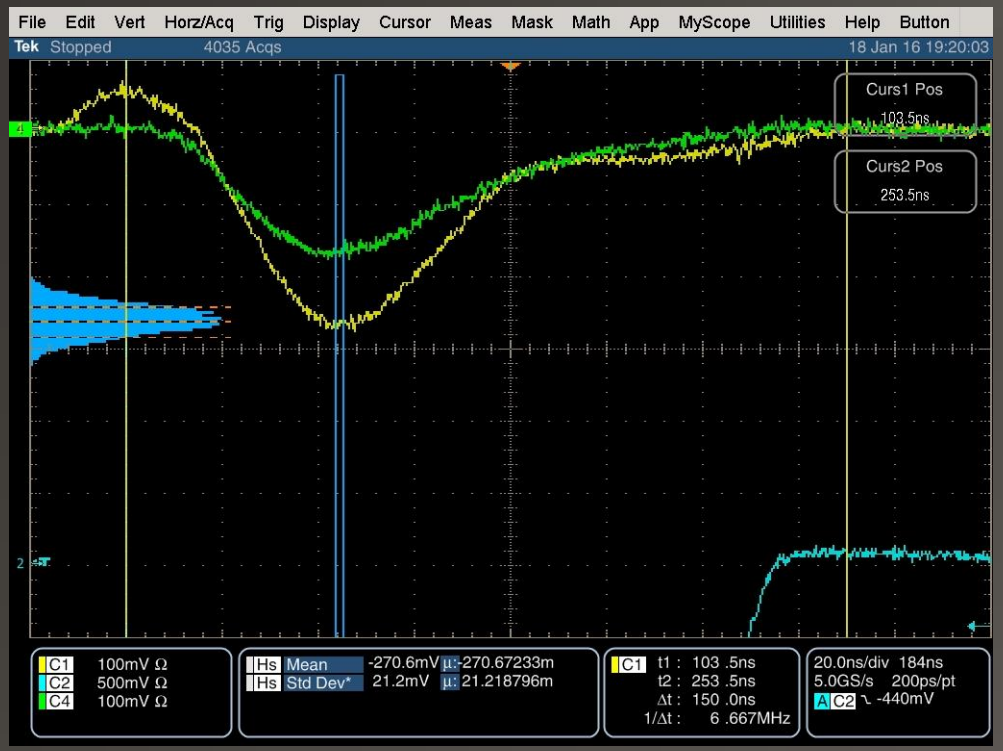
QA testing of W/fiber blocks

365 nm
& 450nm LEDs
In reflective cavities

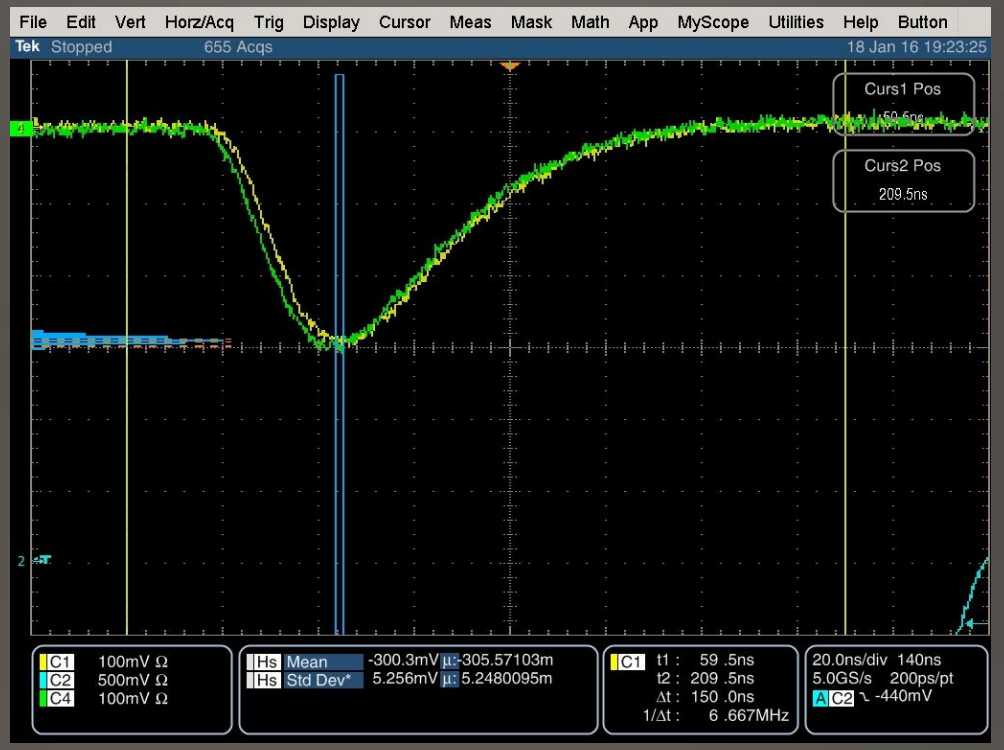




LED and Calibration test pulses



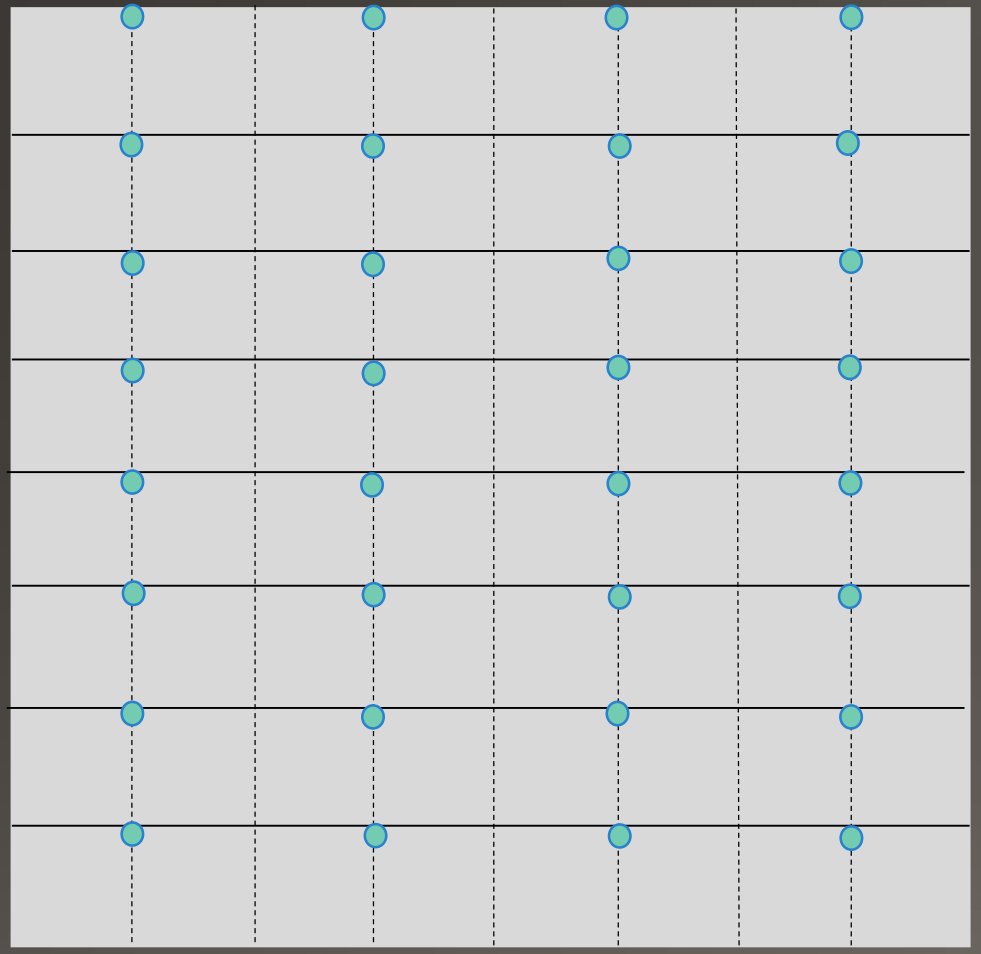
LED pulses
Sigma/mean: 21.2 mV / 270.6 mV = 7.8%



test pulses
Sigma/mean: 5.26/300.3 = 1.8%

- 1x8 preamp board – fully "stuffed"
- 2 channels populated with 4 sipms each
- Powered and read out with cables to bypass interface/controller board

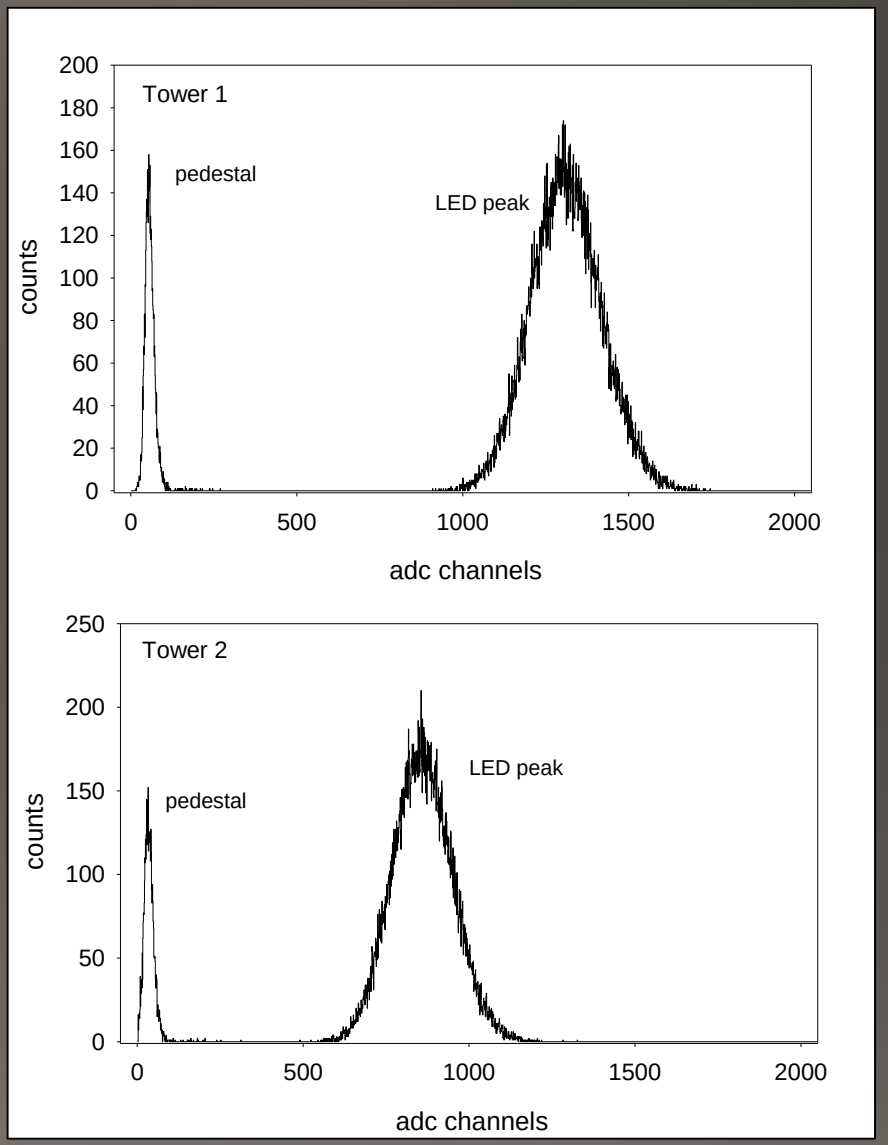
Positioning of LED's in 8x8 EMCal prototype



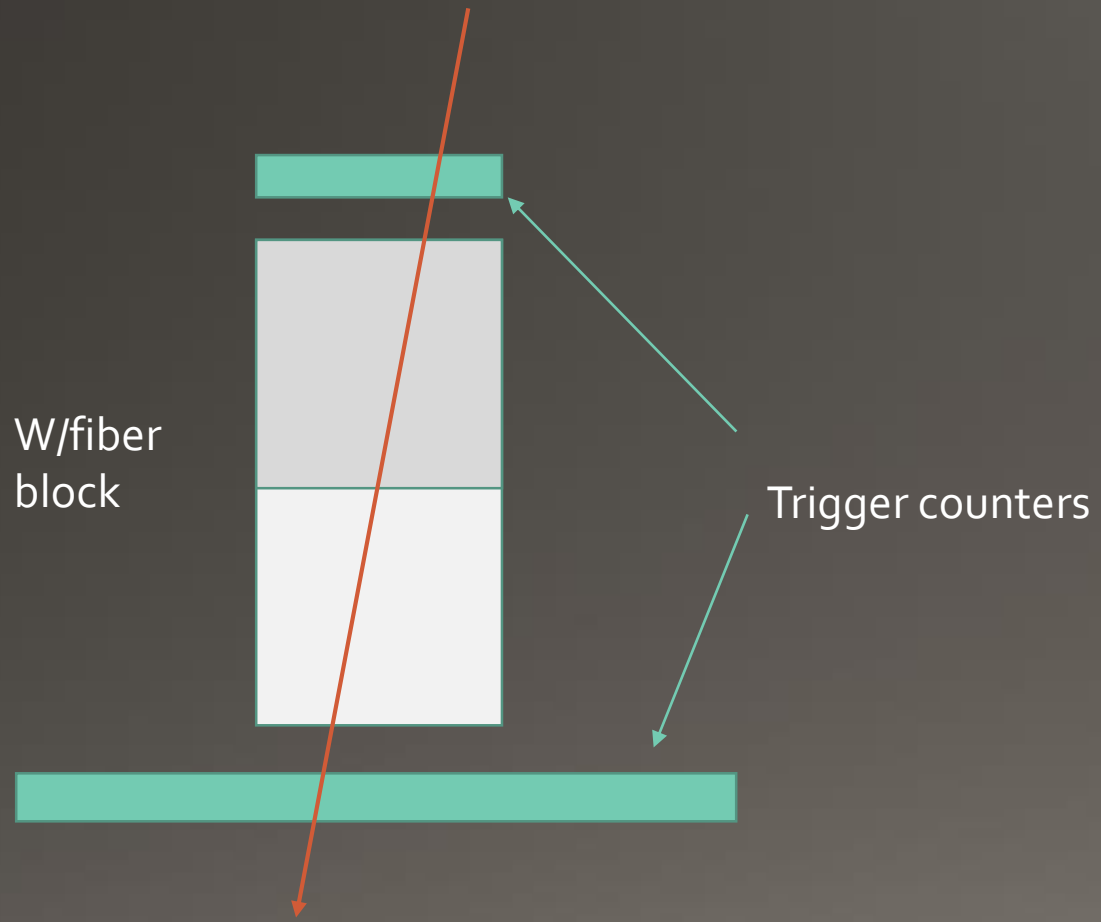
1x8 preamp board

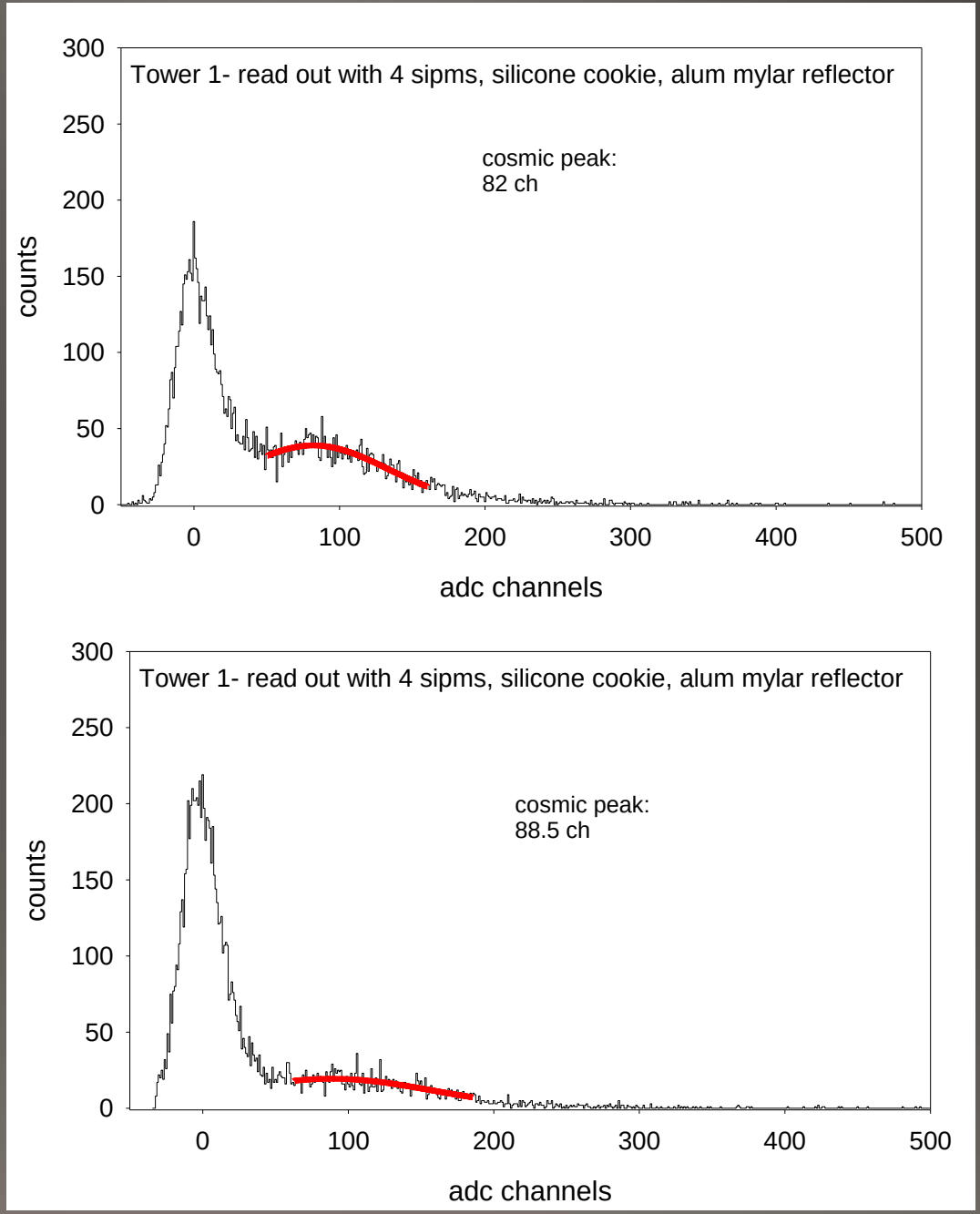
Bottom row "sees" only 1 LED

Output pulses from 2 towers/channels



THP block #7
Light output measurement w/Cosmic ray trigger





UIUC blocks – first assembled row
Light output measurement w/Cosmic ray trigger

Cosmic ray peaks from 3 /8 towers

(need to calibrate spectra – adc ch/upixel)